

NC



PILOT MOUNTAIN, NORTH CAROLINA

STRUCTURAL DESIGN
ENCLOSED BUILDING

MAXIMUM 30'-0" WIDE X 16'-0" EAVE HEIGHT- BOX EAVE
FRAME

25 June 2019

Revision 1

M&A Project No. 18315S/19179S

Prepared for:

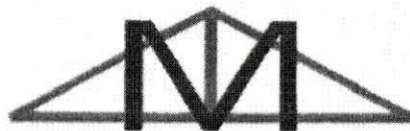
NC Carports and Garages, LLC
309 S. Depot Street
Pilot Mountain, NC 27041

Prepared by:

Moore and Associates Engineering
and Consulting, Inc.

1009 East Avenue
North Augusta, SC 29841

401 S. Main St., Suite 200
Mt. Airy, NC 27030



MOORE AND ASSOCIATES
ENGINEERING AND CONSULTING

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ENGINEERING AND CONSULTING, INC.**

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 CHECKED BY: PH
 PROJECT MGR: WSH
 CLIENT: NC CARPORTS

NC CARPORTS AND GARAGES, LLC
 309 S. DEPOT STREET
 PILOT MOUNTAIN, NC 27041
 30'-0" x 16'-0" ENCLOSED STRUCTURE

DATE: 6-25-19
 SCALE: NTS
 SHT. 1
 DWG. NO: SK-3
 JOB NO: 18315S/19179S
 REV: 1

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INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR MAXIMUM 30'-0" WIDE x 16'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA BUILDING CODE, 2009 INTERNATIONAL BUILDING CODE (IBC), 2012 IBC AND 2015 IBC.
3. DESIGN LOADS ARE AS FOLLOWS:
 - A) DEAD LOAD = 15 PSF
 - B) LIVE LOAD = 12 PSF
 - C) GROUND SNOW LOAD = 35 PSF
 - = 30 PSF KW (≤ 24'-0" WITH U-CHANNEL COLLAR TIE)
4. 3-SECOND GUST ULTIMATE WIND SPEED (V_{ult}) 105 TO 145 MPH (NOMINAL WIND SPEED 82 TO 112 MPH).
5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE).
6. SIDEWALL COLUMNS AND ENDWALL COLUMNS ARE SIMILAR IN SIZE, UNLESS NOTED OTHERWISE.
7. RISK CATEGORY I
8. WIND EXPOSURE CATEGORY B.
9. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE).
10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 9 INCHES.
11. FASTENERS CONSIST OF #12-14x3/4" SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 16 FEET OR LESS, AND ROOF SLOPED OF 14" (3:12 PITCH) OR LESS. SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.
12. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH COLUMN.
13. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/WELDED NUT 30" LONG. SOIL NAILS MAY BE USED FOR WIND SPEEDS < 145 MPH AND IN SUITABLE SOIL CONDITIONS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED FOR WIND SPEEDS > 145 MPH AND/OR IN SUITABLE SOILS AS NOTED.
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
 SOIL SITE CLASS = D
 RISK CATEGORY I/II/III
 R = 3.25 $I_e = 10$
 S_{DS} = 2.039 V = 0.6W
 S_{D1} = 1.259

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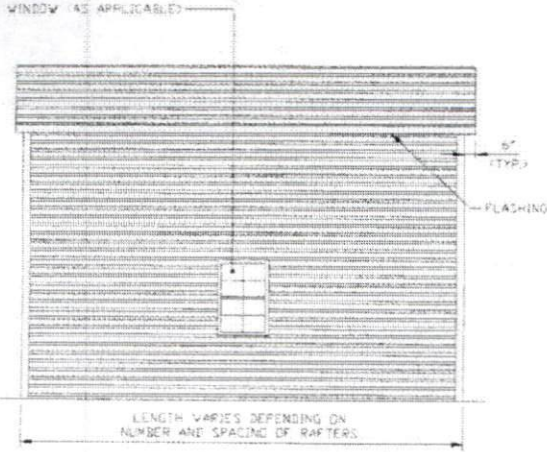
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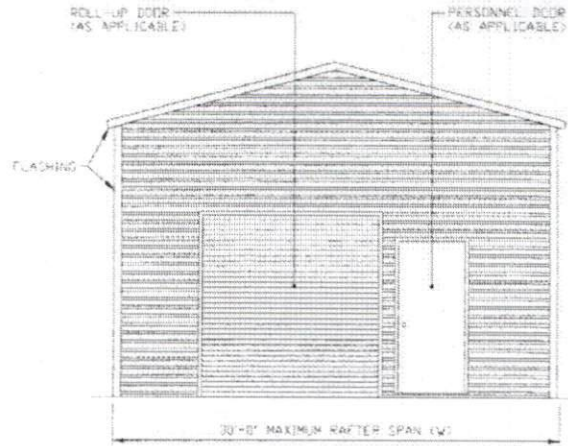
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BOX EAVE FRAME RAFTER STRUCTURE



TYPICAL SIDE ELEVATION
SCALE: NTS



TYPICAL END ELEVATION
SCALE: NTS

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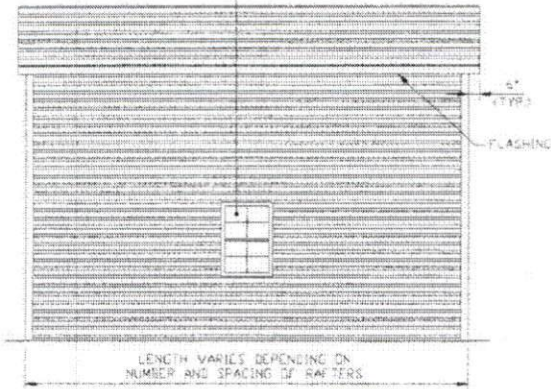
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BOW EAVE FRAME RAFTER STRUCTURE

WINDOW (AS APPLICABLE)

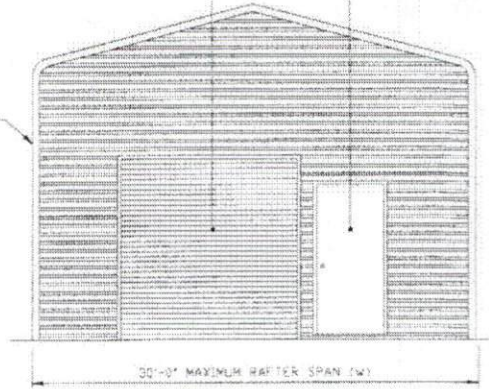
ROLL-UP DOOR
(AS APPLICABLE)

PERSONNEL DOOR
(AS APPLICABLE)



TYPICAL SIDE ELEVATION
SCALE: NTS

FLASHING



TYPICAL END ELEVATION
SCALE: NTS

LENGTH VARIES DEPENDING ON
NUMBER AND SPACING OF RAFTERS

30'-0" MAXIMUM RAFTER SPAN (W)

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SHT. 3C

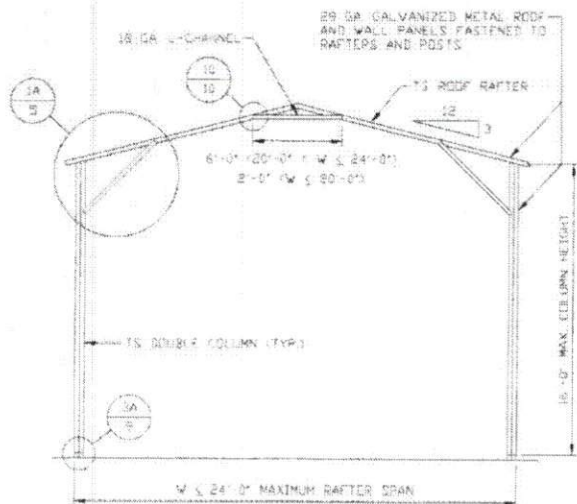
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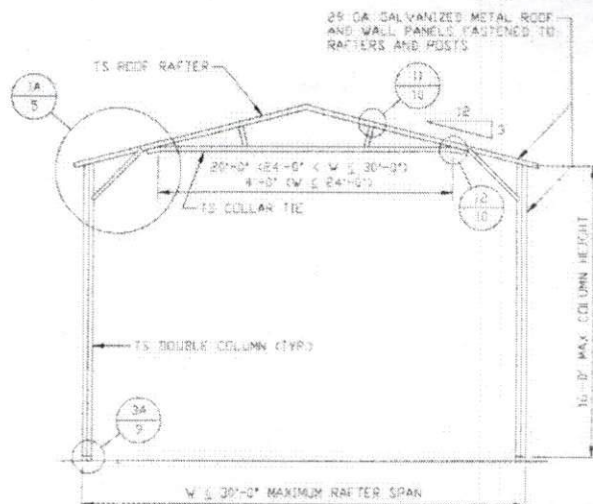
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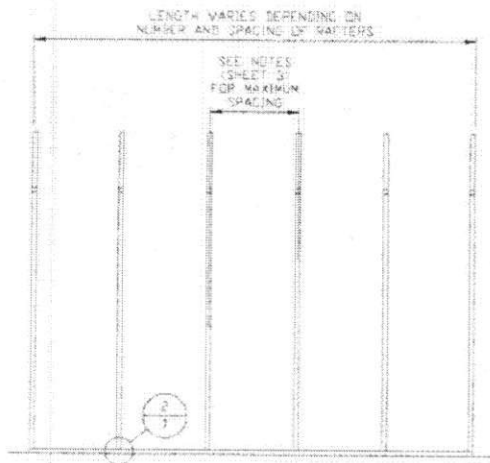
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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS

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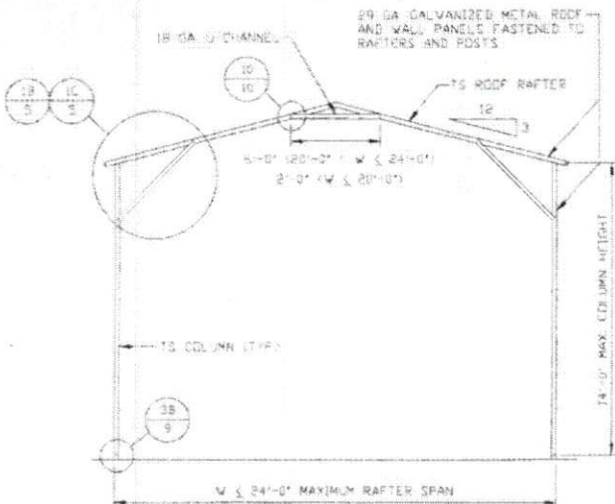
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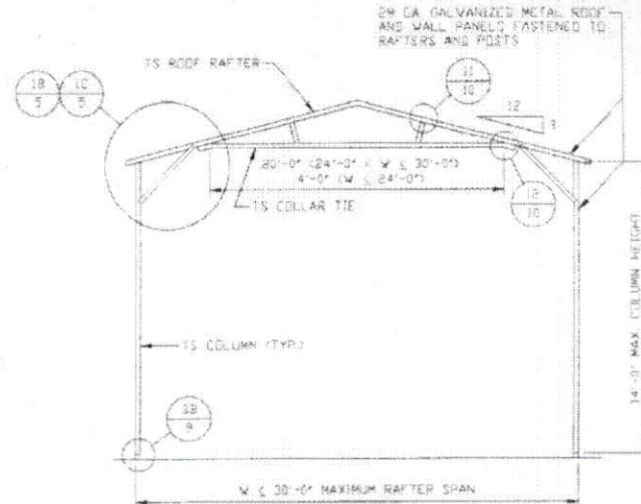
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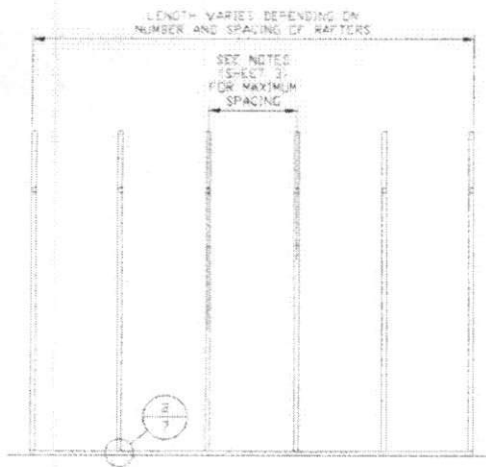
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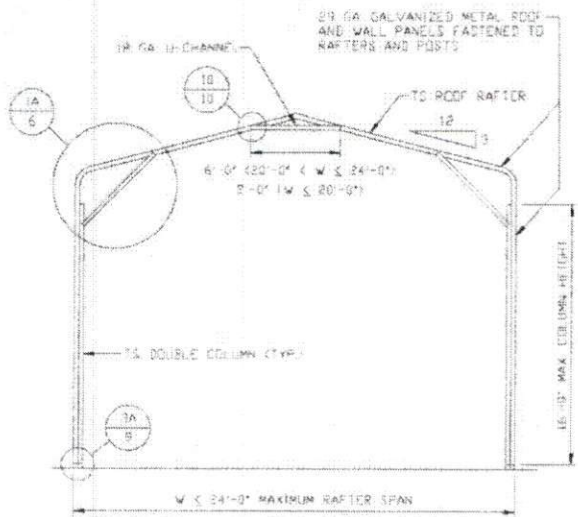


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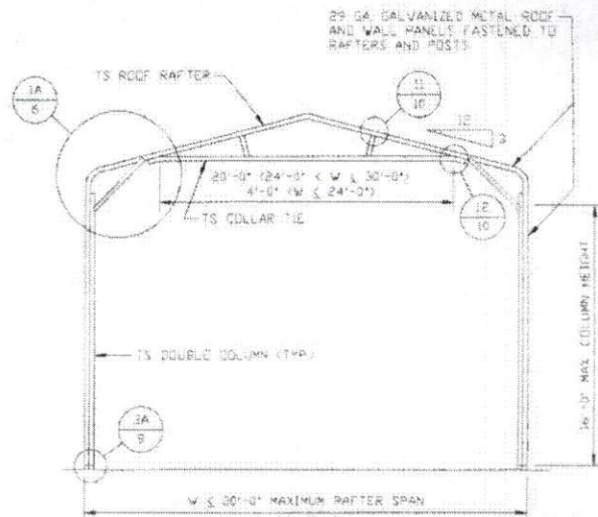


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS

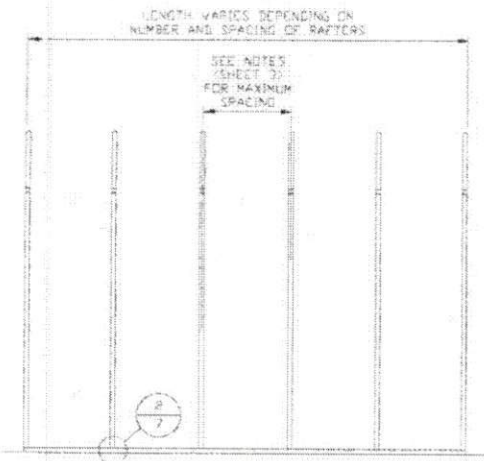
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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS

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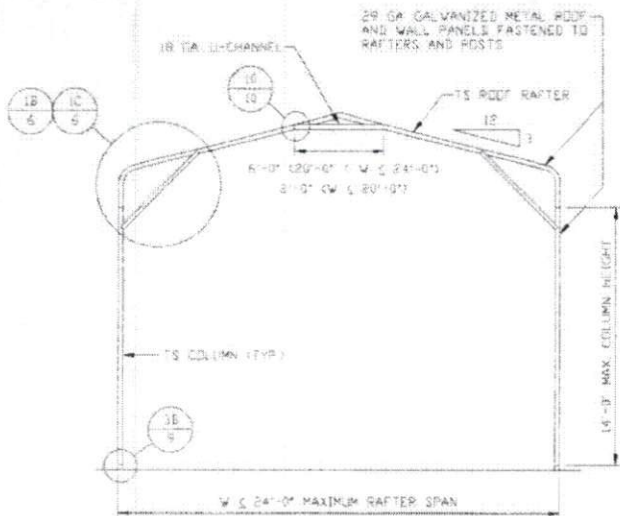
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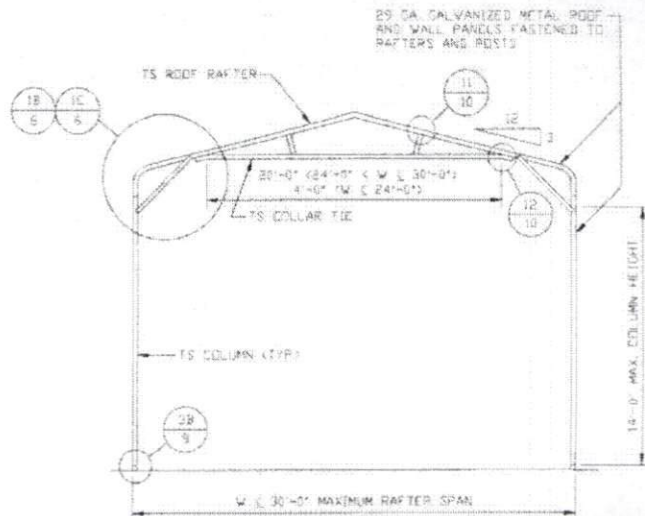
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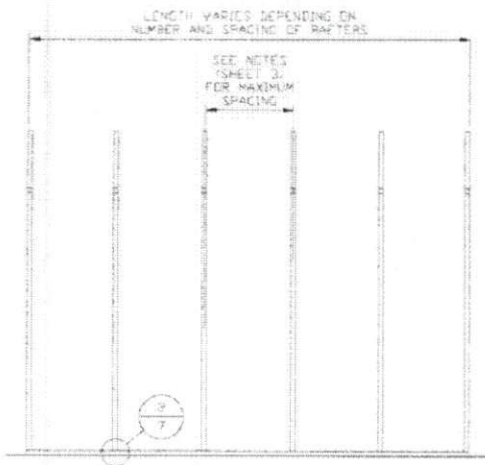
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183155/191795
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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS

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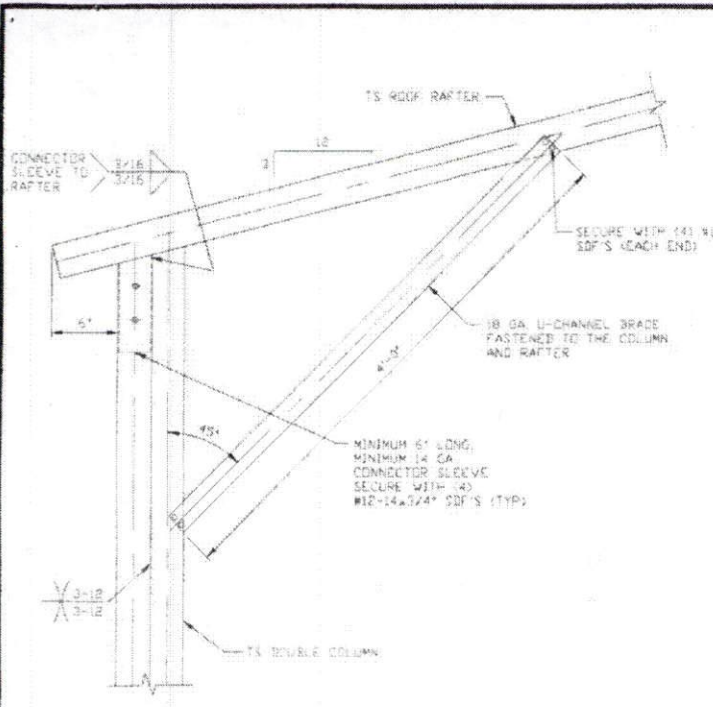
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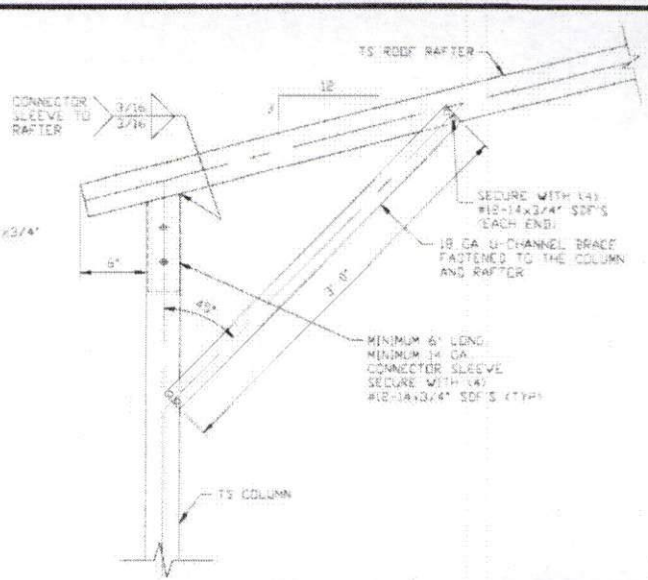
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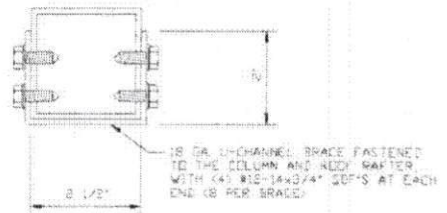
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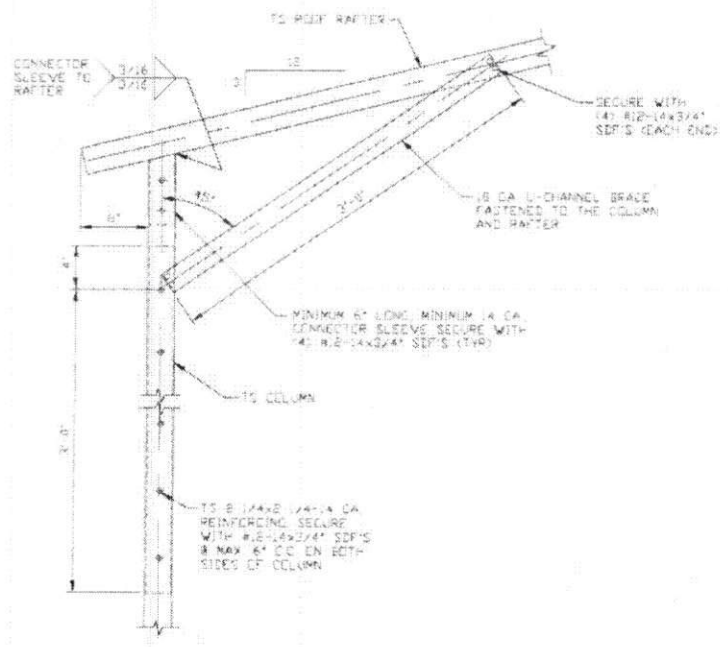
1A BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 16'-0" SCALE: NTS



1C BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS <= 12'-0" SCALE: NTS



BRACE SECTION SCALE: NTS



1B BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO <= 14'-0" SCALE: NTS

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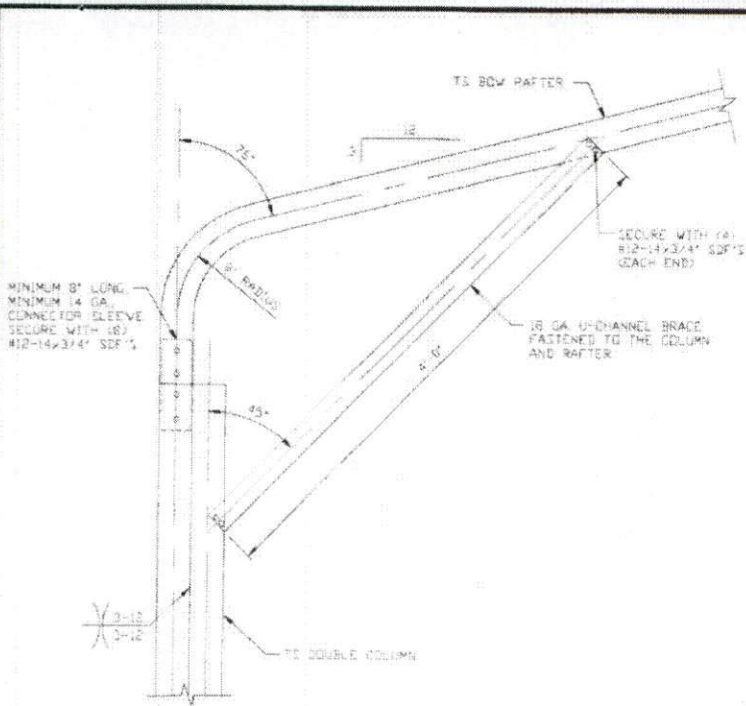
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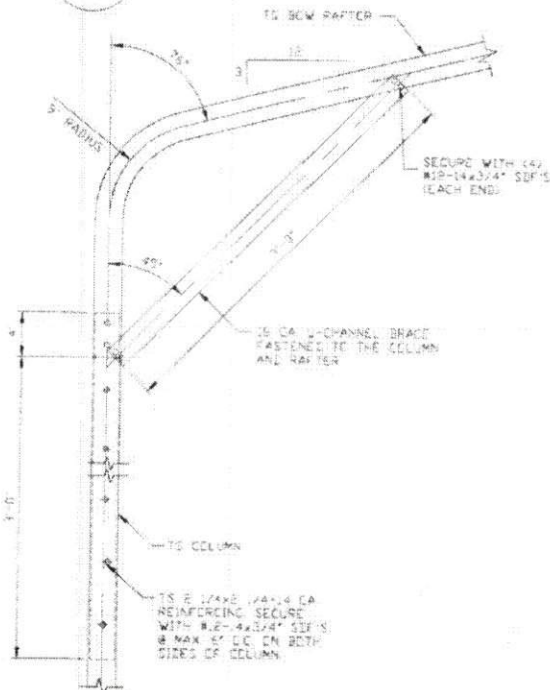
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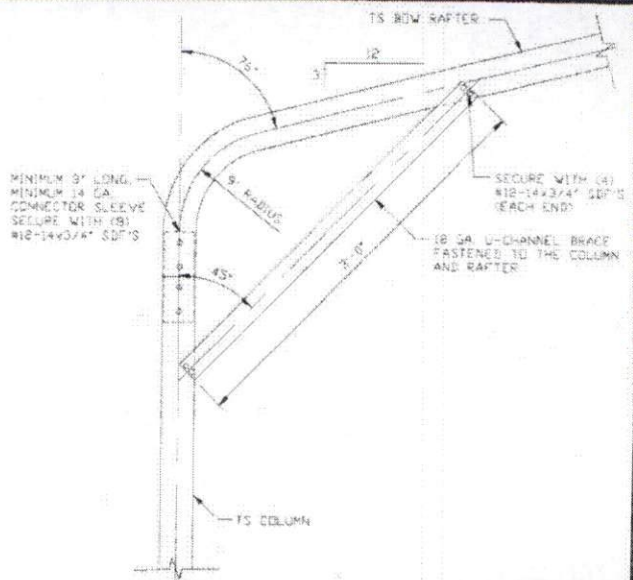
1A BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 16'-0"

SCALE: NTS



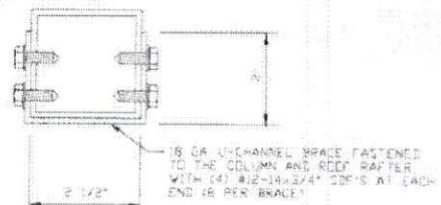
1B BOW RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO <= 14'-0"

SCALE: NTS



1C BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS <= 12'-0"

SCALE: NTS



BRACE SECTION

SCALE: NTS

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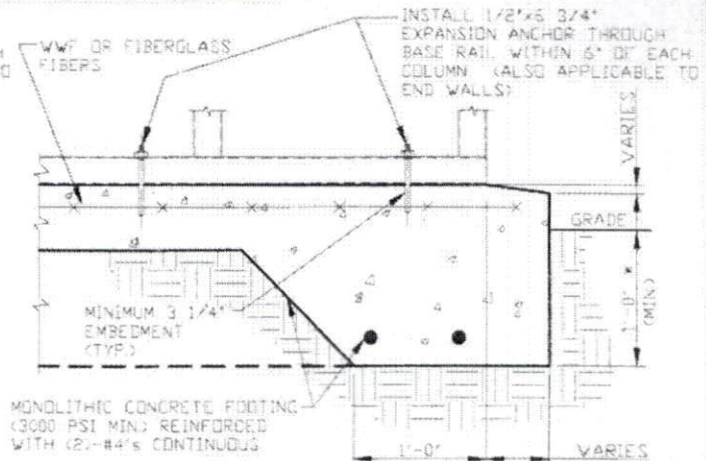
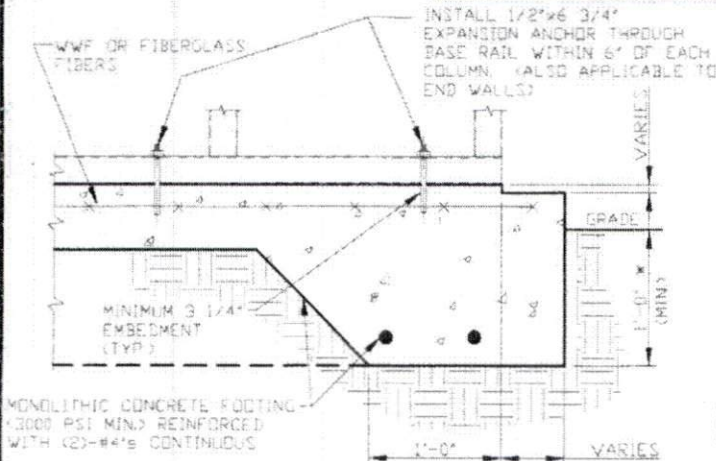
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BASE RAIL ANCHORAGE OPTIONS



2A

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS
MINIMUM ANCHOR EDGE DISTANCE IS 4"
* COORDINATE WITH LOCAL CODES/ORD.

2B

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS
MINIMUM ANCHOR EDGE DISTANCE IS 4"
* COORDINATE WITH LOCAL CODES/ORD.

GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF

CONCRETE:

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS

COVER OVER REINFORCING STEEL:

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318

3" IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2" ELSEWHERE.

REINFORCING STEEL:

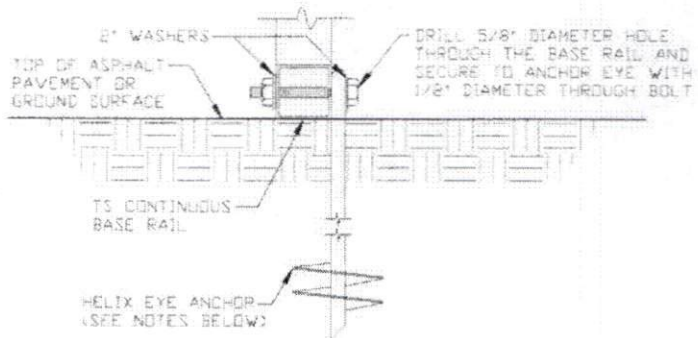
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:

1. REINFORCEMENT IS BENT COLD
2. THE DIAMETER OF THE BEND MEASURED ON THE INSIDE OF THE BAR IS NOT LESS THAN SIX-BAR DIAMETERS
3. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT

HELIX ANCHOR NOTES:

1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT
2. FOR CORAL USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT
3. FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT
4. FOR LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6" HELICES WITH MINIMUM 50" EMBEDMENT
5. FOR VERY LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6" HELICES WITH MINIMUM 60" EMBEDMENT



2C

GROUND BASE HELIX ANCHORAGE

SCALE: NTS
(CAN BE USED FOR ASPHALT)

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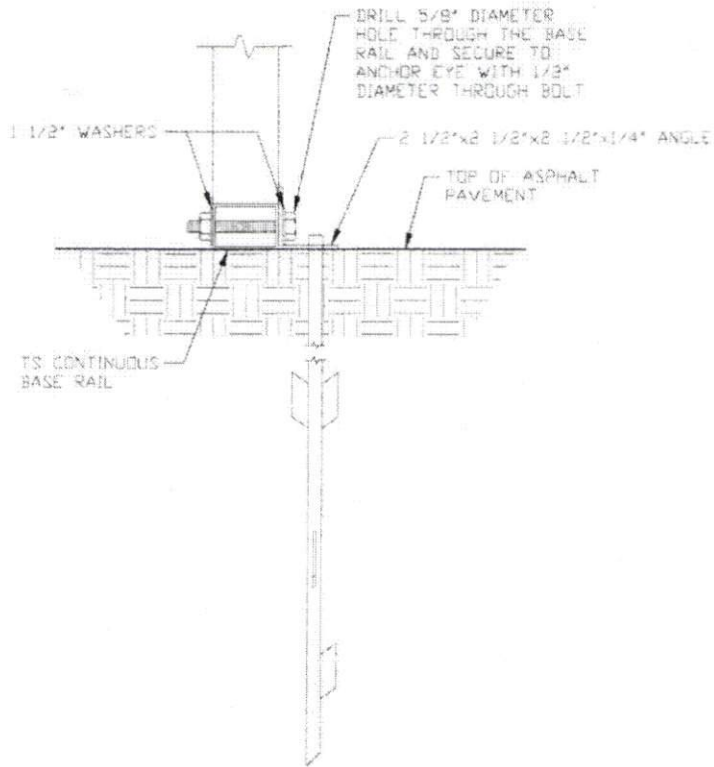
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JOB NO:
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BASE RAIL ANCHORAGE OPTIONS



2D
 ASPHALT BASE ANCHORAGE
 SCALE: NTS

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CLIENT: NC CARPORTS

NC CARPORTS AND GARAGES, LLC
 309 S. DEPOT STREET
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SCALE: NTS

SHT. 7A

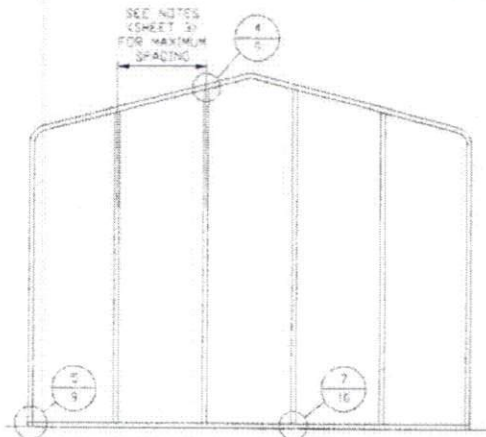
DWG. NO: SK-3

JOB NO:
183155/19179S

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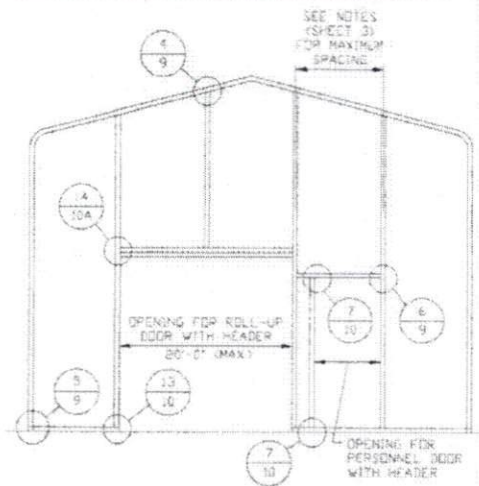
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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



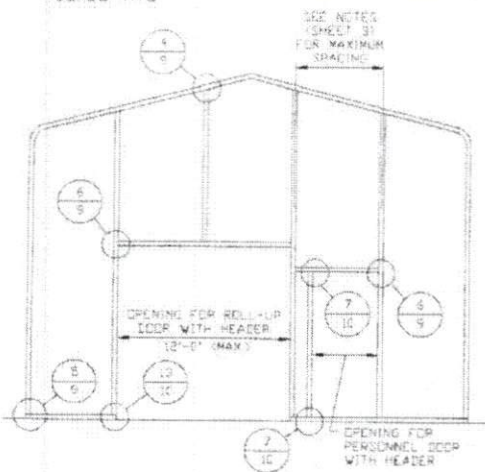
**TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION**

SCALE: NTS



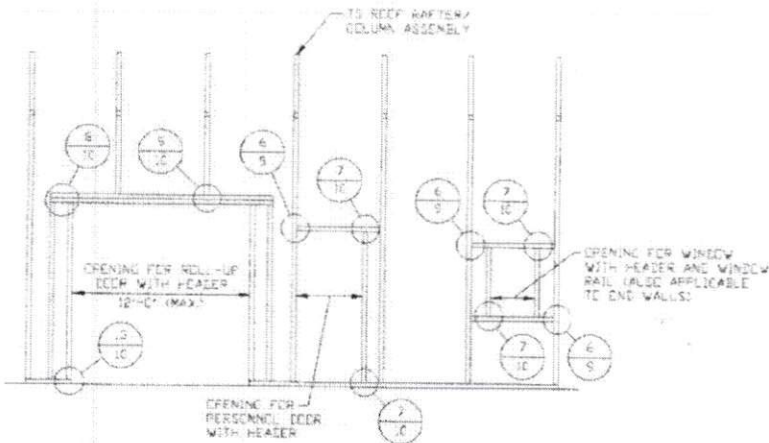
**TYPICAL BOX EAVE RAFTER END
WALL OPENINGS FRAMING SECTION**

SCALE: NTS



**TYPICAL BOX EAVE RAFTER END
WALL OPENINGS FRAMING SECTION**

SCALE: NTS



**TYPICAL BOX EAVE RAFTER
SIDE WALL OPENINGS FRAMING SECTION**

SCALE: NTS

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SCALE: NTS

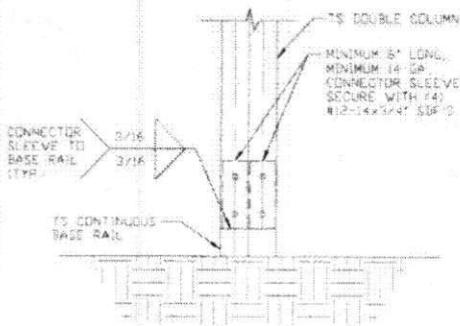
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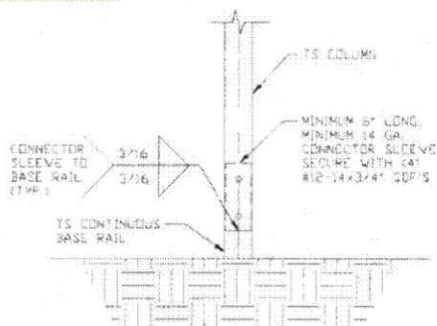
CONNECTION DETAILS



3A

POST/BASE RAIL CONNECTION DETAIL

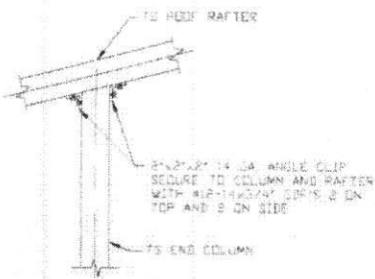
SCALE: NTS



3B

POST/BASE RAIL CONNECTION DETAIL

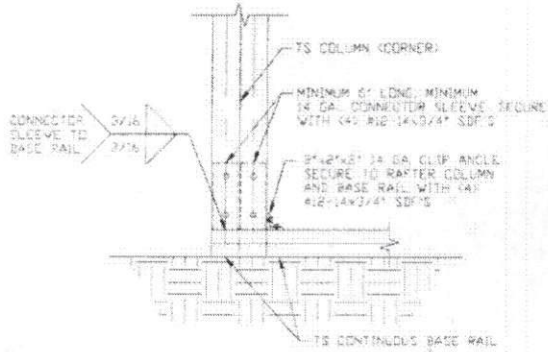
SCALE: NTS



4

END COLUMN/RAFTER CONNECTION DETAIL

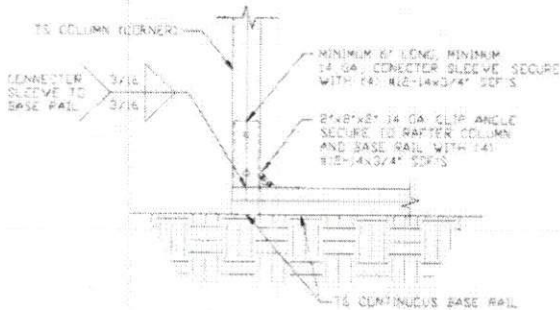
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5A

END COLUMN/BASE RAIL CONNECTION DETAIL

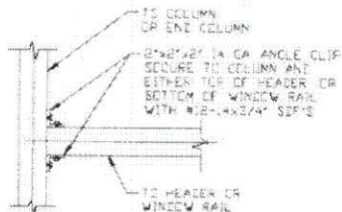
SCALE: NTS



5B

END COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



6

COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL

SCALE: NTS

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SCALE: NTS

DWG. NO: SK-3

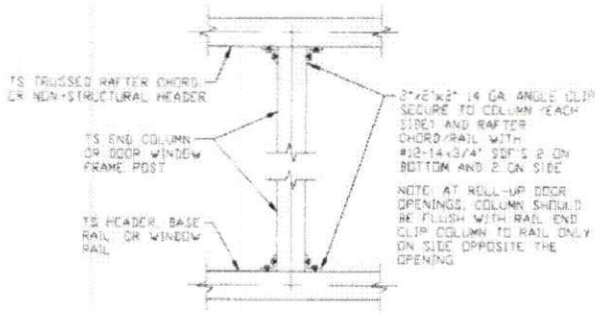
JOB NO:

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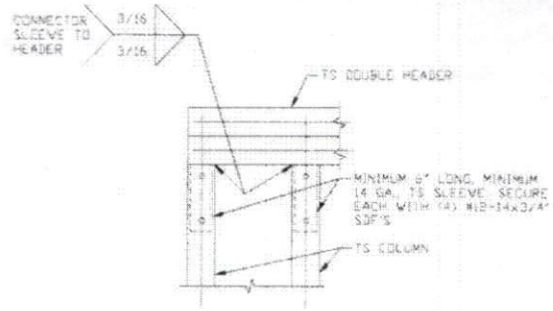
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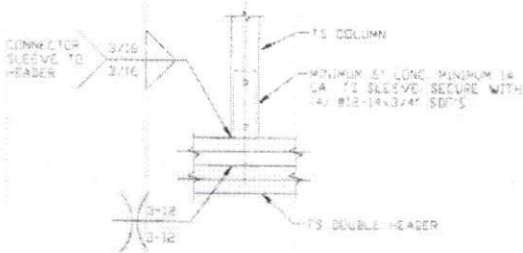
CONNECTION DETAILS



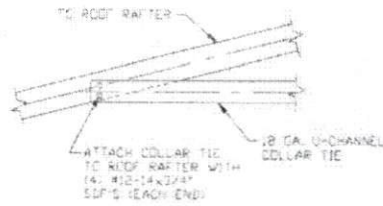
7 COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL
SCALE: NTS



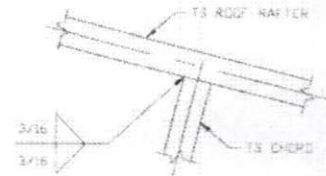
8 DOUBLE HEADER/COLUMN CONNECTION DETAIL
SCALE: NTS



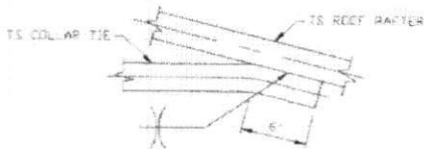
9 COLUMN/DOUBLE HEADER CONNECTION DETAIL
SCALE: NTS



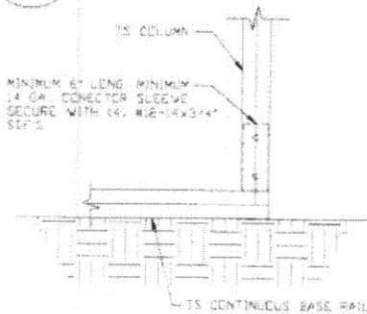
10 COLLAR TIE CONNECTION DETAIL
SCALE: NTS



11 RAFTER TO CHORD CONNECTION DETAIL
SCALE: NTS



12 COLLAR TIE CONNECTION DETAIL
SCALE: NTS



13 COLUMN/BASE RAIL CONNECTION DETAIL
SCALE: NTS

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SHT. 10

SCALE: NTS

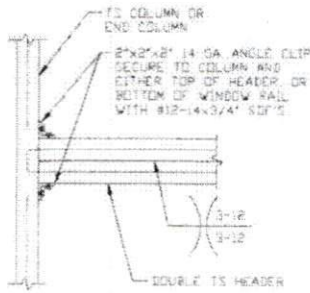
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CONNECTION DETAILS



**DOUBLE HEADER TO COLUMN
CONNECTION DETAIL**

14

SCALE: NTS

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DATE: 6-25-19

SHT. 10A

SCALE: NTS

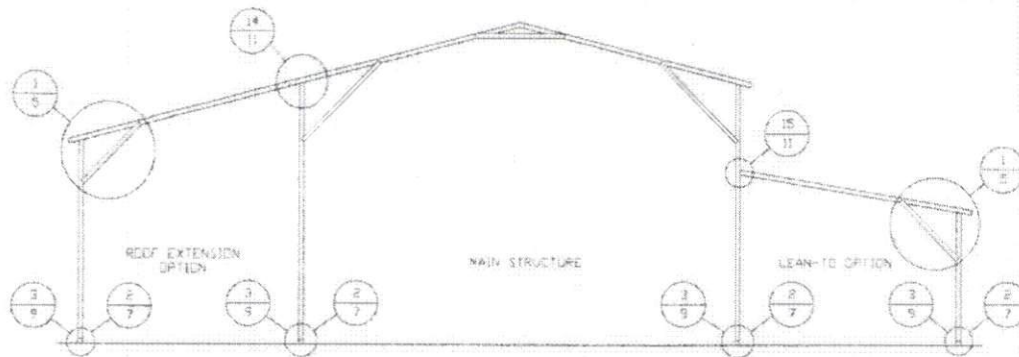
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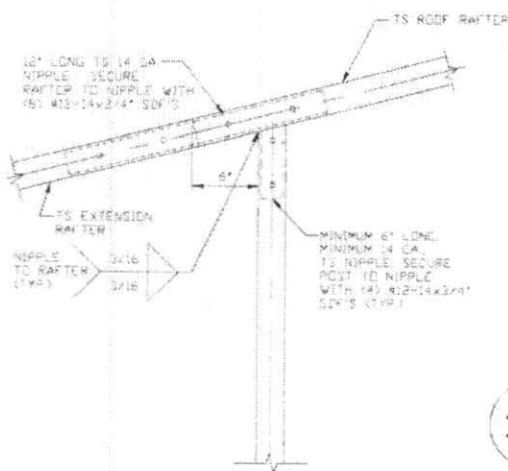
BOX EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

SCALE: NTS

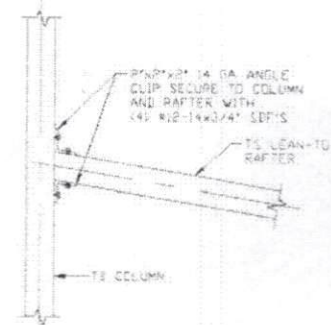
MAXIMUM WIDTH OF SINGLE MEMBER ROOF EXTENSION AND LEAN-TO OPTION IS 12'-0"
 MAXIMUM WIDTH OF DOUBLE MEMBER ROOF EXTENSION AND LEAN-TO OPTION IS 16'-0"



15A

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\leq 12'-0"$

SCALE: NTS



15B

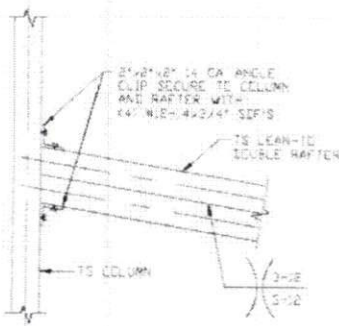
LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\leq 12'-0"$

SCALE: NTS

14

ROOF EXTENSION RAFTER/CORNER POST DETAIL FOR WIDTHS $\leq 12'-0"$

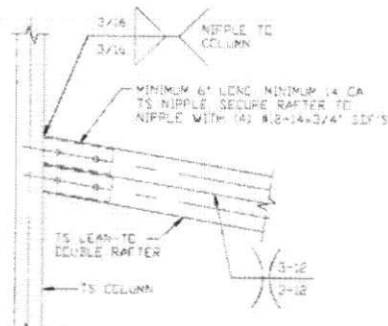
SCALE: NTS



15C

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\leq 16'-0"$

SCALE: NTS



15D

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\leq 16'-0"$

SCALE: NTS

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SHT. 11

SCALE: NTS

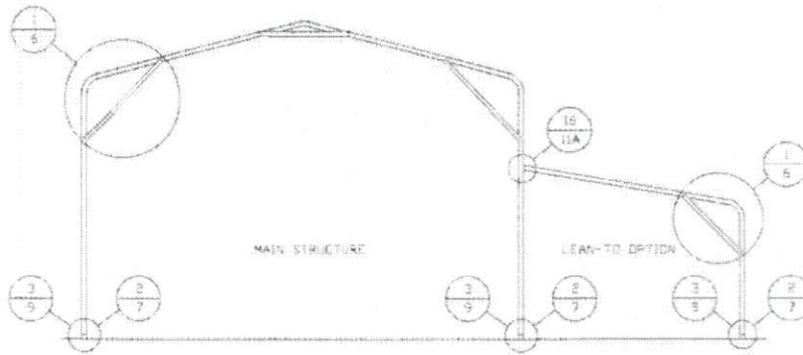
DWG. NO: SK-3

JOB NO:
 18315S/19179S

REV: 1

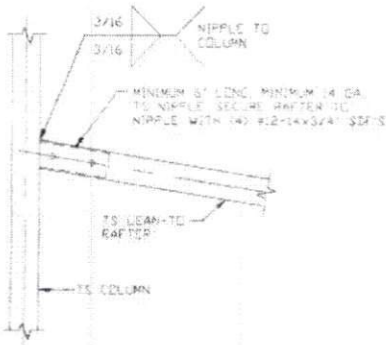
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BOW EAVE RAFTER LEAN-TO OPTIONS



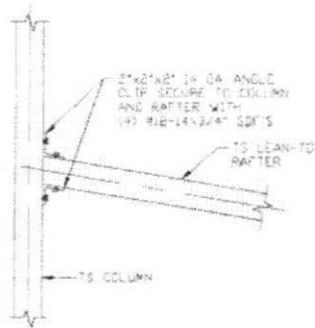
TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

SCALE: NTS
 MAXIMUM WIDTH OF SINGLE MEMBER LEAN-TO OPTION IS 12'-0"
 MAXIMUM WIDTH OF DOUBLE MEMBER LEAN-TO OPTION IS 16'-0"



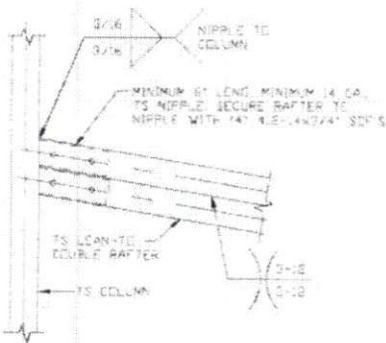
16A LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\le 12'-0''$

SCALE: NTS



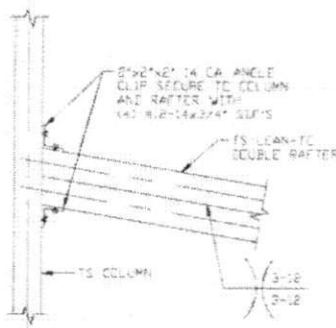
16B LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\le 12'-0''$

SCALE: NTS



16C LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\le 16'-0''$

SCALE: NTS



16D LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS $\le 16'-0''$

SCALE: NTS

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SHT. 11A

SCALE: NTS

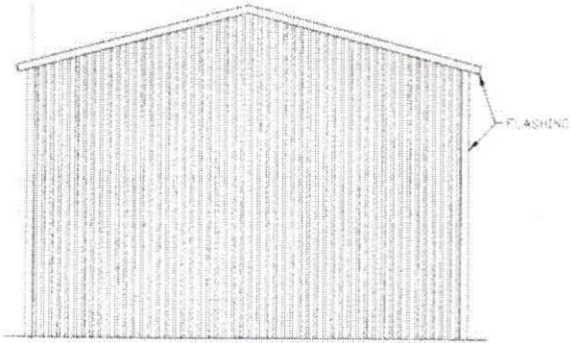
DWG. NO: SK-3

JOB NO:
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REV: 1

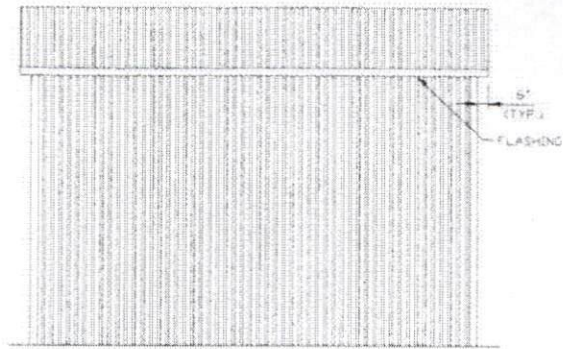
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BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



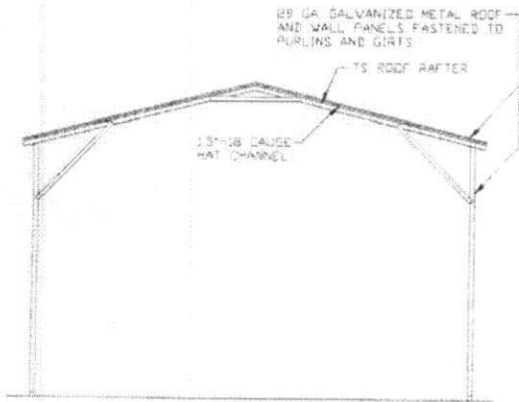
**TYPICAL END ELEVATION
VERTICAL ROOF/SIDING**

SCALE: NTS



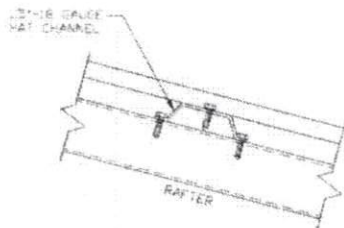
**TYPICAL SIDE ELEVATION
VERTICAL ROOF/SIDING**

SCALE: NTS



**TYPICAL SECTION
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS



PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS

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SHT. 12

SCALE: NTS

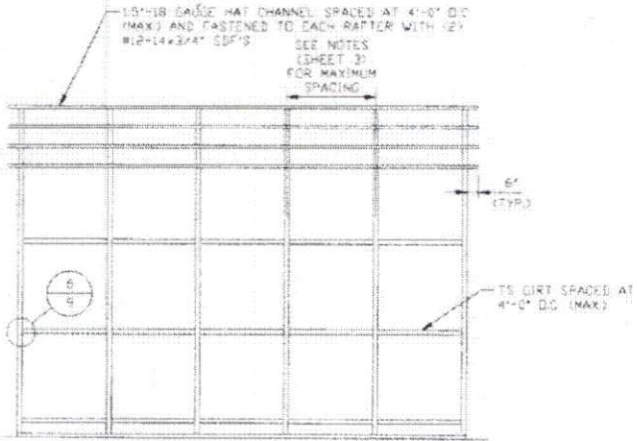
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BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



TYPICAL FRAMING SECTION
 VERTICAL ROOF/SIDING OPTION
 WITH TS GIRTS

SCALE: NTS

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SHT. 12A

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